

11 p.s.k.
**EXHAUST LINE CATALYST OR MUFFLER SHELL FOR MOTOR VEHICLE AND
METHOD OF PRODUCING ONE SUCH SHELL**

RELATED U.S. APPLICATIONS

Not applicable.

STATEMENT REGARDING FEDERALLY SPONSORED
RESEARCH OR DEVELOPMENT

Not applicable.

REFERENCE TO MICROFICHE APPENDIX

Not applicable.

FIELD OF THE INVENTION

[0001] The invention relates to an exhaust line catalyst or muffler shell for a motor vehicle, defined by a tube made by rolling and welding a metal strip, this tube having, at one at least of its ends, a deformation by flospinning aimed at defining an inlet and/or an outlet exhaust-gas cone. The invention also relates to its manufacturing process.

[0002] The present invention will find its application in the field of the muffler or catalyst shell being part of an exhaust line for a motor vehicle.

BACKGROUND OF THE INVENTION

[0003] It is known to manufacture the muffler or exhaust line catalyst shells for a motor vehicle either by a crimping process or by flospinning. In the first case, this shell results, for example, from rolling

a sheet blank onto itself. The edges of the blank are then united through crimping, in order to form the shell against the ends of which are inserted inlet and outlet cones. The flosspinning solution consists in deforming by means of adapted tools the ends of such a tube so as to shape inlet and outlet cones ending through a reduced-diameter tube section. It should be noted that the tube itself is achieved by shaping and welding, starting from a slab or a metal strip.

[0004] In this respect, this metal strip, of a width corresponding to the perimeter of the tube passes through a shaping unit ensuring the rolling of this strip onto itself so as to have its lateral sides end-to-end before their welding occurs.

[0005] Therefore, the tube continuously leaving this shaping line is cut into regular sections which will then be directed towards the other stands of the manufacture of mufflers and catalysts, in particular towards the flosspinning stands, for defining inlet and outlet cones. Compared to the manufacture by mechanical welding, the flosspinning solution results into products having a lower cost price, since they require a shorter manufacturing time, but having in addition an increased strength. Hence, within the framework of a first inventive step, there has been thought of reconsidering the manufacture of such a muffler shell, starting from a tube made by rolling a welded metal strip, in order to finally obtain an even stronger product and, especially, allowing to considerably reduce the risk of manufacturing faults.

[0006] Within the framework of a second inventive step, the constraints imparted to the material forming the tube during flosspinning have been analyzed and there has been observed that the material flow, occurring in a primarily axial direction with respect to the tube, results into subjecting the weld line, extending in this same direction, to significant constraints, resulting in localized weakenings and

micro-cracks, which results into a significant rate of rejects; not mentioning a poorer strength of the shell over the time.

[0007] In this respect, within the framework of a mass production, if there is a substantial risk of defect products, a control simply by sampling is not possible any more and it is essential to set up a systematic control unit, which also increases the production cost.

BRIEF SUMMARY OF THE INVENTION

[0008] Under such circumstances, there has been devised to manufacture a shell starting from a tube manufactured by rolling and welding a metal strip, knowing that in the portions undergoing a deformation by flospinning, the weld line of said tube does not extend according to a parallel direction, but forms an angle with respect to the axis of this tube.

[0009] Advantageously, the tube results from a process of rolling and welding a metal strip into a spiral. Under such circumstances, the weld line itself forms a spiral about the tube, so that it cannot extend parallel to the axis of the latter, in particular in the portions which have to be deformed, in particular by flospinning.

[0010] The advantages resulting from this invention are substantial, since there is achieved a substantial reduction of the risk of defaults at the level of the weld line, in the areas formed by flospinning, of a muffler or catalyst shell.

[0011] To this end, the invention relates to a muffler or exhaust line catalyst shell for a motor vehicle, defined by a tube made by rolling and welding of a metal strip, this tube having, at one at least of its ends, a deformation by flospinning aimed at defining an inlet and/or an outlet exhaust-gas cone,

characterized in that at least in the portion or portions of the tube shaped by flospinning the weld line ensuring the closing of the rolled metal strip forms an angle with respect to the axis of said tube.

[0012] The invention also relates to a process for manufacturing such a muffler or exhaust line catalyst shell for a motor vehicle comprising an inlet and/or outlet cone ending through a reduced-diameter tube section, characterized in that:

- a tube is made by rolling and welding a metal strip into a spiral; and
- in order to form the inlet and/or outlet cone of said shell, one and/or the other end of the tube is deformed by flospinning.

[0013] Other objects and advantages of this invention will become clear from the following description.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWINGS

[0014] This description will be better understood when referring to the attached drawings, in which:

[0015] - figure 1 is a schematic view of a muffler or exhaust line catalyst shell according to the invention;

[0016] - figure 2 is a schematic view of the tube, before flospinning, aimed at forming this shell.

DETAILED DESCRIPTION OF THE INVENTION

[0017] As shown in the figures of the attached drawing, the present invention relates to a muffler or exhaust line catalyst shell 1 for a motor vehicle.

[0018] This shell usually ends, at its ends 2,3, in an inlet cone 4 and an outlet cone 5. The latter end through a reduced-diameter tube section 6, 7 and through which the muffler or the catalyst is integrated into said exhaust line.

[0019] Finally, this shell 1 is manufactured starting from a metal tube 8 at the ends 9, 10 of which have been performed deformations by flospinning, in order to shape the inlet 5 and outlet 4 cones.

[0020] This tube 8 and the flospinning tool 11 are shown schematically in figure 2.

[0021] Finally, the tube 8 results from rolling and welding a metal strip 12, knowing that in the portions 13, 14 of this tube 8 shaped by flospinning the weld line 15 ensuring the closing of this rolled metal strip 12 forms an angle 16 with respect to the axis 17 of said tube 8.

[0022] Advantageously, the latter results from rolling said metal strip 12 into a spiral, so that the weld line 15 itself describes a spiral the tangent line of which is nowhere parallel to this axis 17 of the tube 8, in particular in the portions 13, 14 which have to be deformed by flospinning.